Available online at www.sciencedirect.com

SciVerse ScienceDirect

Procedia - Social and Behavioral Sciences 46 (2012) 4703 – 4707

Procedia
Social and Behavioral Sciences

WCES 2012

The comparison of public and private primary schools children physical fitness

Asiye Filiz Camliguney [a] *, Semih Yilmaz [a], Aytekin Soykan [a], Esra Akbas Kekec [a], Tugce Tanis [a], Nusret Ramazanoglu [a]

[a] *Marmara University, Physical Education and Sport, Turkey*

Abstract

To study the effect of differences between public and private primary schools sharing a common curriculum. Between the ages of 7 and 11, educated in public and private primary schools were included in this study. Girls and boys participating in physical education classes were evaluated on right-left hand grip and leg strength using a dynamometer; on flexibility, using sit-and-reach flexibility test; on balance, using flamingo balance test and on coordination, hand-eye coordination test. The results of the effect of physical education on physical fitness of children displayed statistically significant differences only in leg strength.

Keywords: physical education, physical fitness, primary school, children

1. Introduction

Inactivity or lack of physical activity is an obstacle to promotion of a healthy and active lifestyle. An important challenge of Physical Education (PE) is the promotion of regular, habitual exercise for a healthy lifestyle.

Regular participation in physical activity is associated with important short- and long-term health benefits for children and adolescents in physical, cognitive, emotional, and social domains (Sallis, Prochaska, & Taylor, 2000; Yang, Telama, Viikari, & Raitakari, 2006). Health benefits can be seen in terms of a direct improvement to childhood health status and to adult health status (as a result of childhood health improvement). There is also some evidence physical activity behavior tracks to adulthood, with active children more likely to become active adults (Boreham & Riddoch, 2001). Identifying factors that determine adolescent physical activity may be important in increasing physical activity levels at all ages (Strong et al., 2005; Hardy, Okely, Dobbins, & Booth, 2008). Fundamental motor skills must be mastered before development of more sport-specific skills. In cross-sectional research "motor proficiency" has been positively associated with sport participation and total, moderate-to-vigorous, skill-specific, organized physical activity in children and adolescents (Fisher et al., 2005; Wrotniak, Epstein, Dorn, Jones, & Kondiliz, 2006; Raudsepp & Pall, 2006).

A high physical fitness level is indicative of a community with a healthy future. Therefore, countries develop their own physical fitness measurement methods to evaluate the changes in sport habits and physical fitness from childhood on, aiming exercise promotion to improve health-related physical fitness. Motor abilities development

* Asiye Filiz Camliguney . Tel.: +90-216-308-5661
E-mail address: filizcamliguney@marmara.edu.tr

 doi:10.1016/j.sbspro.2012.06.322

from childhood on is possible with regular and planned exercise. Fundamental motor abilities are more commonly developed during childhood (Clark & Metcalfe, 2002). It has also been suggested that motor abilities attained in childhood may have subsequent benefits on skills and activity levels in adolescence (Stodden et al., 2008; McKenzie, Alcaraz, Faucett, & Sallis, 1997), and thus, PE lessons are developmentally sequential. Leisure time activities contribute to maintenance of an active lifestyle from childhood to adulthood. Sports and physical education are contexts that different types of goals can be set (Kingston & Wilson, 2009). The sequential attainment of these goals requires time investment. However, physical education instructional time is limited.

The purpose of this study was to determine differences in physical fitness levels of students enrolled in public and private primary schools sharing a common curriculum, yet differing on school policies and physical infrastructures.

2. Material and Methods

150 students, between the ages of 7 and 11, participating in physical education classes offered two hours/week throughout the school year were included in this study. 75 students from public (boys n=35, girls n=40) and private primary schools (boys n=44, girls n=31) participated in this study.

The body mass was assessed to the nearest 0,1 kg (Seca) and the standing height was measured to nearest 0,5 cm using a Seca Stadiometer (Seca, Hamburg, Germany) with the subject's shoes off and head in Frankfort line, horizontal plane. Body mass index (BMI) was calculated from weight and height (BMI (kg/m^2)=Weight (kg)/(Height)^2 (m)). Arm, leg and sitting height was measured with a meter.

Performance fitness tests were conducted on all chidren in May, the last month of the school year.

Hand grip (right-left) and leg strength (kg) parameters were measured using dynamometry; flexibility, using sit-and-reach (cm) test; balance, using flamingo balance test and coordination using (right-left) hand-eye coordination test. The students gave their informed consent to the experimental procedure as required by the Helsinki declaration (1964).

Statistical analysis; Independent-Samples T test was applied in order to make within group and within gender. SPSS 14. Packet programme was used.

3. Results

Findings of this study are indicated in the following tables:

Table 1. The demographic features of Public and Private School children

	Public School		Private School	
	Girls (n=40)	Boys (n=35)	Girls (n=31)	Boys (n=44)
Age (Year)	9.48±1.43	8.54±1.34	8.97±1.43	9.02±1.42
Height (cm)	136.05±11.36	131.26±8.19	136.81±9.73	137.64±11.11
Weight (kg)	33.63±8.97	29.87±7.79	33.61±9.46	36.11±11.55
BMI (kg/m^2)	17.87±2.82	17.09±2.66	17.7±3.2	18.64±4.02
Arm Lenght (cm)	52.98±5.26	51±3.73	54±5.45	53.5±4.95
Leg Lenght (cm)	76.15±9.37	72.86±6.74	77.65±6.86	79.64±6.99
Chest Lenght (cm)	37.4±5.09	36.01±4.81	34.13±3.34	36.36±5.15

Table 2. Within and between gender performans Physical Fitness test results of in each school

	Public School Girls (n=40)	Private School Girls (n=31)	p	Public School Boys (n=35)	Private School Boys (n=44)	p
Sit and Reach (cm)	23.23±6.22	25.97±7.75	.113	22.31±5.13	21.25±5.51	.378
Flamingo Balance Test (sn)	11.88±8.37	11.65±11.64	.926	6.2±4.26	5.11±2.54	.189
Hand-Eyes Coordianation Test Right Side Start (sn)	11.73±13.28	7.42±8.29	.099	13.09±11.12	10.43±19.34	.447
Hand-Eyes Coordianation Test Left Side Start (sn)	10.08±12.37	6.58±6.18	.125	11.11±11.60	10.27±13.03	.763
Leg Dynamometry (kg)	36.82±12.10	48.68±11.27	.000**	39.27±10.65	53.10±16.97	.000**
Handgrip Right (kg)	13.30±4.55	12.9±3.77	.683	12.16±3.40	12.84±3.49	.385
Handgrip Left (kg)	12.85±4.15	12.17±3.73	.468	11.77±2.97	12.11±3.12	.615

Right-left hand grip (p>.005), sit and reach (p>.005), flamingo balance (p>.005), hand (right-left)-eyes coordination (p>.005) were not statistically significantly different between groups; while leg dynamometry results displayed statistically significant differences (p=.000). Leg strength of private school students were greater than those of public schools. Within school results showed that girls had better physical fitness than boys, i.e flamingo balance test (p=.000, p=.004), sit-and-reach (cm), flexibility test (p=.005) results were statistically significantly higher.

4. Discussion

Fundamental motor skills lay the foundations of basic and advanced sports skills. School activities improve fine motor abilities. This study showed that physical education classes offered to public and private primary school students did not affect differently their physical fitness parameters other than leg strength.

Right-left hand grip, sit-and-reach, flamingo balance, hand (right-left)-eye coordination tests results were not significantly different between groups, while leg strength tests were statistically significant. The approach to PE classes displayed no difference in favor of enhanced physical fitness. Girls and boys attending private schools had more leg strength due to differences in lifestyle and the higher amount of extra-curricular physical activities.

Intense after-school program can produce significant, sustainable improvement in motor skills and fitness of children (Matvienko & Ahrabi-Fard, 2010). The relation between fine and gross motor abilities in children (boy and girl) showed that the level of motor ability is correlated with school activities (Piek, Baynam, & Barrett, 2006).

Hand-Eye Coordination (Right and Left Side) test results were not statistically significantly different between public and private primary school students.

Researchers were examined the influence of a three-week instructional cup stacking unit on the hand-eye coordination of elementary school children was examined (Hart, Smith, & De Chant-Bruennig, 2006). In another

study, on hand-eye coordination, the first/second graders performed slower than the third and fourth graders (Udermann, Murray, Mayer, & Sagendorf, 2004).

Coordination skills were found to be statistically significantly different between elementary school boys and girls (Kostic et al., 2009; Zurc, Pisot, & Stojnik, 2005). However, Quan et al. (2000) found no statistically significant difference between these groups.

Within school comparison of physical fitness of girls and boys in public and private schools showed that girls scores for Flamingo Balance Test and Sit-and-Reach (cm) Test of were significantly higher than boys. This difference can be caused from physical characteristics between girls and boys.

Miñarro et al. (2007) and Chillo et al. (2010) reported higher scores for men than women when using several versions of the sit-and-reach test, including the back-saver sit-and-reach test. In our study, we also observed a gender based difference among private school students. We think that the higher flexibility scores of private school female students may be due to the special education (private dance and ballet classes) that these girls may have been taking, and girls have more flexible body in terms of physical fitness characteristics.

Generally, families who have high socio-economic status prefer to private schools for their children education. However, this study show that there were no difference in terms of physical fitness characteristics between public and private primary school students without leg strenght parameter. Thus, PE levels of public schools were not lower than PE levels of private school. Future studies should focus on application approaches or facilities of physical education classes in the common curriculum between public and private primary schools.

Acknowledgements

This study is supported by Marmara University Scientific Research Committee, Project No. SAG-D-040112-0016.

References

Boreham, C., & Riddoch, C. (2001). The physical activity, fitness and health of children. *J Sports Sci,* 19, 915-929

Clark, J.E., & Metcalfe, J.S. (2002). The mountain of motor development: A metaphor. *In Motor development. Research and reviews*. 2,163-190.

Chillo, P., Castro-Pinero, J., Ruiz, J.R., Soto, V.M., Carbonell-Baeza, A., Dafos, J., Vicente-Rodriguez, G., Castillo, M.J., & Ortega, F.B. (2010). Hip flexibility is the main determinant of the back-saver sit-and-reach test in adolescents. *Journal of Sports Sciences,* 28(6), 641-648.

Fisher, A., Reilley, J.J., Kelly, L.A., Montgomery, C., Williamson, A., Paton, J.Y., & Grant, S. (2005). Fundamental movement skills and habitual physical activity in young children. *Med Sci Sport Exerc*, 37, 684-688

Hardy, L.L., Okely, A.D., Dobbins, T.A., & Booth, M.L. (2008). Physical activity among adolescents in New South Wales (Australia): 1997 and 2004. *Med Sci Sport Exerc,* 40, 835-841

Hart, M.A., Smith, L.A., & De Chant-Bruennig, A. (2006). Effect of participation in a cup stacking unit on hand-eye coordination of elementary children. *Physical Educator*, 63(3), 154-159.

Kingston, K., & Wilson, K. (2009). The application of goal setting in sport. In S. Mellalieu, & S. Hanton (Eds.), *Advances in applied sport psychology*: 75-123.

Kostic, R., Duraskovic, R., Pantelic, S., Zivkovic, D., Uzunnovic, S., & Zivkovic, M. (2009). The relations between anthropometric characteristics and coordination skills, *Physical Education and Sport*, 7(1), 101-112

Matvienko, O., & Ahrabi-Fard, I. (2010). The effects of a 4-week after-school program on motor skills and fitness of kindergarten and first-grade students. *American Journal of Health Promotion*, 24(5), 299-303.

McKenzie, T.L., Alcaraz, J.E., Faucett, F.N., & Sallis, J.F. (1997). Effects of physical education program on children's manipulative skills. *J Teach Phys Educ*, 17, 327-341.

Miñarro, P.A.L., Andujar, P.S.B., Garcia, P.L.R., & Toro, E.O. (2007). A comparison of the spine posture among several sit-and-reach test protocols. *Journal of Science& Medicine in Sport*, 10(6), 456-462.

Quan, D.Q., Xu, C.G., Yian, B.T., Huang, H., Pan, T.T., Xu, Z., Lu, D.J., Guo, X., Zhao Y.H., & Zhang, Y. (2000). The reserch on developmental-law of motor coordination ability of children in 7-12 years. Retrieved 21.11.2006. at: http://www.ausport.gov.ou./fulltext/2000.

Piek, J.P., Baynam, G.B., & Barrett, N.C. (2006). The relationship between fine and gross motor ability, self-perception and self-worth in children and adolescents. *Hum Mov Sci*, 25(5), 244-252.

Raudsepp, L., & Pall, P. (2006). The relationship between fundamental motor skills and outside-school physical activity of elementary school children. *Pediatr Exerc Sci*, 18, 426-435

Sallis, J.F., Prochaska, J.J., & Taylor, W.C. (2000). A review of correlates of physical activity of children and adolescents. *Med Sci Sport Exerc,* 32, 963-975.

Stodden, D.F., Goodway, J.D., Langendorfer, S.J., Roberton, M.A., Rudisill, M.E., Garcia, C., & Garcia, L.E. (2008). A developmental perspective on the role of motor skill competence in physical activity: An emergent relationship. *Quest*, 60, 290-306.

Strong, W.B., Malina, R.M., Blimkie, C.J., Daniels, S.R., Dishman, R.K., Gutin, B., Hergenroeder A.C., Must, A., Nixon, P.A., Pivarnil J.M., Rowland, T., Trost, S., & Trudeau, F. (2005). Evidence based physical activity for school-age youth. *Pediatr*, 146, 732-737.

Udermann, B.E., Murray, S.R., Mayer, J.M., & Sagendorf, K. (2004). Influence of cup stacking on hand-eye coordination and reaction tim of second-grade students. *Perceptual and Motor Skills,* 98, 409-414.

Wrotniak, B.H., Epstein, L.H., Dorn, J.M., Jones, K.E., & Kondiliz, V.A. (2006). The relationship between motor proficiency and physica activity in children. *Pediatrics*, 118, 1758–1765.

Yang, X., Telama, R., Viikari J., & Raitakari, O. (2006). Risk of obesity in relation to physical activity tracking from youth to adulthoo *Med Sci Sport Exerc,* 38, 919-925.

Zurc, J., Pisot, R., & Stojnik, V. (2005). Gender differences in motor performance in 6,5 year old children. *Kinesiologia Slovenica*, 11(1), 90-104.